NOTE XIII.

ON TWO REMARKABLE SPECIES OF APHRODITIDAE OF THE SIBOGA-EXPEDITION

BY

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(With 2 textfigures).

I. *Lepidasthenia sibogae*, n. sp.

At Station 282, off the North East point of Timor, at a depth of 27—54 M., a single Polynoid-worm was kept, that is characterized not only by the singular shape of its elytra, but also by the abnormal manner of their attachment. For the elytra have not the usual appearance of flat, scale-like organs, that are attached at their under side, but they are represented by small oval buds, not quite so high as broad and fixed at their median side to a long elytrophore; there are 26 pairs of them, as in other *Lepidasthenia*-species situated on segment 2, 4, 5, 7, 9—23, 26, 29—65. They are quite smooth and without any appendages. About the internal structure of these organs [1]) I have observed, that like in other elytra there is an epidermis-layer of polygonal cells, ending at their base in fine fibres, forming a dense network in the centre of the organ; the presence of a nerve could not be stated

1) My colleague Dr. H. W. de Graaf was kind enough as to make some transverse and longitudinal sections.

with certainty, but they contain a great number of dark, yellowish, glandular (?) cells. The dorsal cirri are also very short and do not exceed the elytra much in length except at the anterior segments. The parapodia are very slender; in the posterior region they are (with the bristles) as long as the breadth of the body, in the anterior part they measure two thirds of it. The notopodial fascicle is absent and only represented by the acicula; the neuropodial bristles are faintly curved in their distal part and show a short subterminal dilatation with a small number of transverse spinous rows. The inferior setae of this fascicle have a simple undivided apex; however some of the superior ones have a bifurcated tip, the main point of which is elongated in a long, slender, acute limb, whereas the other limb measures about a third of it.

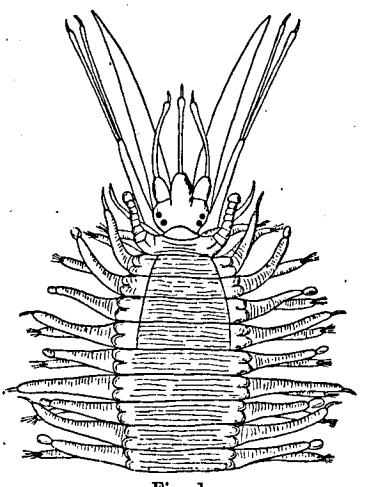

Fig. 1.

In my opinion the situation of the elytra in this species affords a new argument in favour of the morphological similarity of the elytron and the dorsal cirrus, for in *Lepidasthenia sibogae* the tubercula dorsalia (elytron-tubercles) are not only totally absent, but the elytra are fixed at the extremity of long elytrophores, quite agreeing in their situation and appearance with the cirrophores.

It is well known that Darboux [1]), in his elaborate memoir on the Aphroditidae, contests anew the homology of the elytron and dorsal cirrus like in the days of Audouin and Milne-Edwards, almost a century ago, and his compatriot Gravier appears to agree with him; for he

1) Recherches sur les Aphroditiens: Bulletin scientif. de la France et de la Belgique, t. XXXIII, 1900.

writes in his description of *Iphione muricata* [1]): „au dessus de son (cirre dorsal) insertion, il existe un grand lobe foliacé, frangé; c'est le tubercule dorsal, ici particulièrement développé, homologue de l'élytrophore des segments élytrigères."

Darboux pleads for the homology of the elytrophore and dorsal tubercle, chiefly on account of the more median situation of both organs, for he argues: „deux organes homologues sont deux organes qui ont les mêmes connections." Now I think that this is only a part of the truth, while the homology of two organs depends on their agreement of anatomical characters (i. e. structure, form, position and connection), as well as on the similarity of origin. Now, Hans Duncker [2]) in his detailed researches on the morphology of the Aphroditidae, based upon the rich collections of the Museum of Göttingen, clearly demonstrates, that there exists a great difference between the anatomical structure of the dorsal tubercle and the elytrophore, while the first named organ not only has the muscular layer much less developed, but it totally lacks the nerve. On the contrary the elytrophore and the cirrophore quite agree, not only in the development of the muscular layer but also in the presence of a nerve. And with regard to the origin of both organs, Darboux rightly quotes Häcker's sentence [3]): „auch die Anlage der Cirren und Elytren hat anfangs die Form von Knospen. In einem älteren Stadium sehen wir dann die Rückencirren und Elytren als längliche, lappenförmige Gebilde, in einer der Segmentzahl entsprechende Anzahl vorhanden. Noch vor Erreichung des Nectochaeta-stadiums erhalten die sämmtliche Fussstummelanhänge eine mehr flaschenförmige Gestalt. Die genetische Homologie der Elytren

1) Annélides polychètes de la Mer rouge: Nouv. Arch. du Muséum d'Hist. nat. (sér. 4) t. III, 1901, p. 229.

2) Über die Homologie von Cirrus und Elytron bei den Aphroditiden: Zeitschr. f. wissensch. Zoologie, Bd. LXXXI, 1906, p. 191.

3) Die spätere Entwicklung der Polynoë-Larve: Zool. Jahrbücher, Abth. f. Anatomie und Ontogenie, Bd. VIII, 1894, p. 253.

und Cirren ist noch deutlich zu erkennen, insofern an den vierten Elytrenpaar die Endzapfen noch genau die Beschaffenheit der entsprechenden Gebilde der Cirrenanlagen besitzen."

However, Darboux thinks that Häcker's opinion about the homology of both organs only should be based upon „similitude de forme", whereas the german author afterwards should have stated several important histological differences between elytron and cirrus. Now, the only important point of difference that I could find mentioned in Häcker's paper, is „flaschenförmigen Drüsen" making their appearance in the ventral as well as in the dorsal cirri. But Häcker demonstrated, that in the Nectochaetastade all the appendages show a short basal part and a bottle-shaped or scale-like distal part, that in all of them there enters a muscle and a nerve, the branches of which run to the terminal sense-organs. Also the phenomenon, that in some *Lepidasthenia*-species the elytron and the dorsal cirrus take any other's place, in my opinion pleads for the homology of both organs; Ehlers [1]) f. i. found, that in a specimen of *Lepidasthenia irregularis* nine succeeding segments of the posterior body-region at the right side possessed elytra, whereas at the left side there were six elytra and three dorsal cirri; also in *Lepidasth. Digueti* [2]) Grav. and *commensalis* Webst. similar phenomena have been observed. As the Siboga-collection also contains some individuals of the rare *Gastrolepidia clavigera* Schm., I could corroborate Duncker's suggestion, that its ventral lamellae have nothing to do with elytra and that they represent only a lamellar enlargement of the epidermis; in this species there are no dorsal tubercles and the cirriphores are situated nearly in the same line with the elytrophores.

II. *Eulepis malayana*, n. sp.

Station 204; Buton-strait, depth 75—94 M.; Station 260, off Great Key island, depth 90 M.

1) Die Polychaeten des Magellan. u. Chilen. Strandes, 1901, p. 55.
2) Bulletin du Muséum d'Hist. Nat. t. XI, 1905, p. 177.

Though already five species of the genus *Eulepis* (*E. hamifera* Gr., *Wyvillei* McInt., *challengeriae* McInt., *fimbriata* Treadw., *splendida* Treadw.) have been described, yet there still reigns a good deal of uncertainty about its real characters; therefore I was very glad to meet among the Siboga-collection with a couple of specimens of this rather rare genus. Unfortunately the largest specimen is in an indifferent state of preservation; it measures 20 mm. in length and has 37 segments. The other one has a length of only 15 mm., with 34 somites. The head is rounded, without eyes; the paired antennae arise as two pointed, wedge-shaped processes, lying closely to each other, from under the front of the head. The conical tentacle, arising from the middle of the dorsum of the head, scarcely reaches with its tip half the length of the antennae; the tentacle as well as the antennae bear a dark spot on the middle of the dorsal side. The palps are conical, smooth, nearly twice as long as the antennae and not extending much beyond the tentacular cirri. There are 12 pairs of elytra, whitish, semitranslucent, with a notch in the external margin; the anterior five ones are rounded quadrangular, the other ones are elongated, extending over more than one segment. The small specimen possesses only 11 pairs of elytra and, probably, it is not full-grown. The last elytron even extends over seven segments and therefore covers a great part of the posterior body-region. The elytra are situated on segment 2, 4, 5, 7, 9—21, and 24, as mentioned by Treadwell[1]); the posterior elytron therefore

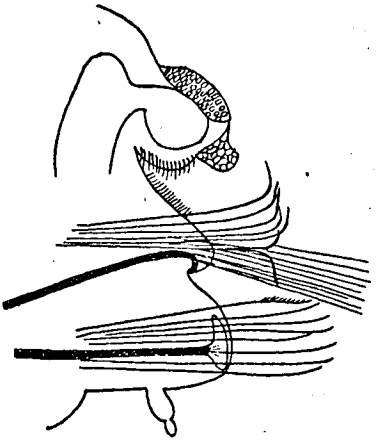

Fig. 2.

1) The Polychaetous Annelids of Porto Rico: Bull. of the U. St. Fish Commission, Vol. XX, Part 2, 1902, p. 181.

is not attached to the 23rd segment, like in the Polynoidae, because it is separated from the foregoing by two branchiae-bearing segments. The long elytrophores as well as the branchial processes are inserted quite next to the median dorsal line. The dorsal appendages of the segments without elytra more resemble the branchial processes of a Sigalionid than a cirrus, for they show a row of cilia at their ventral side, whereas also one or more groups of cilia are situated opposite on the dorsum of the notopodium. However it differs from a Sigalion-branchia therein that it consists of a broad basal portion and a narrower, cirrus-like distal part, separated from each other by a septum. In the segments, situated more posteriorly, this cirrus-like part becomes larger and longer. The basal part contains a peritoneal cavity, in which an intestinal coecum enters and also some eggs are visible; its wall, agreeing with Duncker's description [1]), shows a thin layer of longitudinal muscles and an epidermis-layer, that is very thick at the ventral side of the branchia. At the dorsal side a comb-like ridge is situated, consisting of numerous cells with coarsely-granular contents, presumably of a glandular nature. The distal part consists of large polygonal cells. The third segment has a short, conical dorsal cirrus and at first shows in its notopodium the stout brown bristles, with the tip bent at a right angle towards the shaft, characteristic for this genus; beneath them is a fascicle of slender, capillary bristles, finely serrated along the edge. The neuropodium contains a fascicle of stout yellow setae, winged along both edges and with a fine capillary tip; only the superior of them is shorter and pectinated beneath the tip. This comb consists of about a dozen of large teeth, decreasing distally in length, and of a great number of small ones. This pectinated bristle was first observed by Mc. Intosh in *E. Wyvillei* and *E. challengeriae* [2]), but overlooked

1) loc. cit. p. 315, Textfigures 31 and 32.

2) Annelida Polychaeta: Challenger Reports, Zoology, Vol. XII, 1885, p. 131.

by Grube[1]) in *E. hamifera* (as I presume), as well as by Treadwell in *E. splendida* and *E. fimbriata*, for Augener afterwards stated its presence in *E. splendida*[2]). I suppose, that this remarkable bristle has a different shape in the different species of *Eulepis*. In both parts of the parapodium the distal end of the acicula has a particular shape; in the notopodium it is bent like a hook and in the neuropodium it is enlarged to a transverse lamella, like the head of a hammer. Presumably this represents the „auffallendes braunes breites etwas mondförmiges Plättchen", mentioned by Grube on page 53. The ventral cirrus consists of an enlarged, lamellar basal portion and a clavate terminal appendage. The small worm of Station 204 has a long unpaired anal cirrus, extending over five segments.

Of the five described *Eulepis*-species four are found in West-Indian waters and *E. hamifera* only was dredged in the neighbourhood of the Malay Archipelago (Philippines). Unfortunately Grube had but a single specimen at his disposal and therefore his observations appear to be somewhat incomplete. However I think that the Siboga-species cannot be identified with it; for according to Grube, *E. hamifera* has the surface of the scales densely covered with short papillae, whereas there occur long ones along their exterior and posterior border. The anterior eleven pairs of elytra are situated on segment 2, 4, 5, 7, 9—21; segments 22—27 bear lamellar organs, somewhat resembling elytra, whereas in the posterior body-region all segments are provided with scales. Whether the appendages, occurring on the segments without elytra, are real cirri, remains somewhat dubious; they consist of a large, lamellar, basal portion and a short distal part, but Grube could not recognize the presence of cilia and does not know if they have branchial function. With

1) Annulata Semperiana: Mém. del' Acad. Imp. d. Sc. de St.-Pétersbourg (S. 7) t. XXV, 1878, p. 52.

2) Westindische Polychaeten: Bull. of the Museum of Comp. Zoology at Harvard College in Cambridge, Vol. 43, 1904—08, p. 128.

regard to the number of real elytra I think that only twelve pairs were present; for Grube mentions, that also in *E. hamifera* the twelfth pair of scales are the longest, like in the Siboga-species and in the species described by Treadwell. McIntosh believes, that his *E. Wyvillei* should have fifteen pairs of scales, but as several of the scales were wanting, this could be a mistake; of *E. challengeriae* only an anterior fragment of the body was at his disposal. Therefore I presume, that the genus *Eulepis* is characterized by the presence of 12 pairs of elytra, the posterior of which is the longest and covers a great part of the body.

Leyden Museum, June 1913.